GLOBAL ZERO U.S. NUCLEAR POLICY COMMISSION

MODERNIZING U.S. NUCLEAR STRATEGY, FORCES AND POSTURE FOR THE 21ST CENTURY

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Introduction

Senators Inouye, Feinstein, Alexander, and other distinguished members, it's an honor and a pleasure for us to present testimony before this august committee. Thank you for inviting us and for taking an interest in the findings and proposals of the Global Zero U.S. Nuclear Policy Commission on which we served. We hope our commission report (*Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, May 2012) and remarks here contribute to your vitally important work in protecting America's national security. Our written joint testimony highlights some of the commission's key conclusions and recommendations as well as answers some of the critical questions raised by readers after the report was released to the public.

The Global Zero Commission Aims and Purposes

The goal of the commission was simple: conceive and articulate a nuclear strategy, force structure and posture that best address the national security challenges our country faces in the 21st century. We first considered present and future threats across the spectrum of possibilities, ranging from deliberate or accidental nuclear attack by a nation state to terrorist nuclear attack – and everything in between. Then we assessed the role of U.S. nuclear weapons in diminishing these dangers through deterrence or warfighting, and also weighed the potential for missile defenses, conventional forces, alliance cooperation and diplomacy to offer non-nuclear tools to our kitbag for dealing with these threats. Next we performed a net assessment of both the benefits and risks of further nuclear arms reductions and lowered launch readiness ("de-alerting"). Finally, we formulated a new construct for a 21st century nuclear strategy.

Of special interest to the commission was the paramount goal of broadening the scope of nuclear arms reductions to include all countries and all types of weapons in their possession. The nearly half-century of arms negotiations with the Russians has been an exclusively two-sided affair that has excluded some important players. These negotiations need to be extended to China and other nations that maintain existing or planned nuclear arsenals. The major risks of nuclear weapons use, proliferation and arms race instability in fact mostly lie outside the U.S.-Russian arena, particularly in Northeast and South Asia and in the Middle East. It is essential to begin a multilateral process that brings the rest of the nuclear-armed world to the negotiating table to begin to cap, freeze, reduce and otherwise constrain these third-country nuclear arms programs. We estimate that U.S. and Russian arsenals would need to be downsized substantially – 900 or fewer total weapons on each side – in order to draw these third-countries into the process.

A 2022 U.S. Nuclear Force

Our net assessment concluded that the current U.S. nuclear force remains sized and organized operationally for fighting the "last war" – the Cold War – even though threats from that era posed by the Soviet Union and China have greatly diminished or disappeared. Russian and China are not mortal enemies of the United States. Our geopolitical relations with our former Cold War adversaries have fundamentally changed for the better.

The U.S. (and Russian) arsenal is thus over-stocked. Ample latitude exists for further nuclear cuts. The extent of such cuts, the composition of the reduced arsenals, and the number of weapons held in reserve as a geopolitical hedge against a downturn in relations are matters worthy of public debate, and of

congressional hearings. There are a number of alternative force structures that would well serve to maintain a credible U.S. nuclear deterrent and advance other national security interests.

In the commission's view, one such illustrative nuclear force would be composed of 900 total strategic weapons – total deployed and reserve – on a dyad of ballistic missile submarines and strategic bombers. This would represent a steep (80 percent) reduction from the current U.S. arsenal, but it would not be a small force, nor a humble force designed for minimal deterrence. It would not entail a radical shift in targeting philosophy away from military targets to population centers. It is not a city-busting strategy. On the contrary, it would hold at risk all the major categories of facilities in all the countries of interest – a diverse set of nuclear/WMD forces and facilities, top military and political leadership, and war-supporting industry. It would fulfill reasonable requirements of deterrence vis-à-vis every country considered to pose a potential WMD threat to the United States.

Strengthening Universal Nuclear Disarmament and Non-Proliferation

At the same time, an arsenal shrunk to 900 total U.S. weapons, matched by comparable Russian reductions, would represent a dramatic cut that should work to draw the other nuclear countries into a multilateral process culminating in formal arms reduction negotiations among all nations with nuclear arms.

It should also demonstrate a serious U.S. and Russian commitment to fulfilling their disarmament obligations under Article 6 of the Non-Proliferation Treaty, and thereby help rally the anti-proliferation community to greater efforts to thwart would-be proliferators. The idea is not that virtuous U.S. and Russian behavior in the form of steep nuclear arms reductions will inspire aspiring proliferators to abandon their quests. We do not subscribe to this naïve notion. Rather, there are reasons to believe that such behavior could inspire our anti-proliferation partners to get tougher with recalcitrant states seeking the bomb.

Reducing U.S.-Russia Nuclear Arms Through Negotiations

The commissioners agreed that cuts to 900 total nuclear weapons in the U.S. and Russian arsenals should be the aim of the next round of bilateral New START follow-on negotiations. We call upon them to reach a comprehensive, verifiable agreement that provides for equal reductions by both sides down to a total force of 900 weapons that counts all types of strategic and non-strategic weapons – with "freedom to mix" on both sides – and that counts every individual warhead or bomb whether deployed or held in reserve.

We wish to emphasize that the commission does not call for unilateral cuts by the United States. Our view is that the only valid and useful approach should be to negotiate an agreement with the Russians. However, there may well be other ways to advance the goal of further reductions. Some unilateral steps, or parallel reciprocal steps along the lines of the 1991 Presidential Nuclear Initiatives, could facilitate the effort. For instance, Russia has already dropped below its allowed ceiling of 1,550 deployed strategic forces stipulated by the New START agreement. It may behoove the United States to follow in Russia's footsteps and take advantage of Russia's unilateral reductions to reduce U.S. forces below the allowed level as an approach designed to remove the incentive for Russia to build its forces back up and take advantage of the benefits, set out further in this presentation, of additional reductions.

This would serve to lower the ceiling on deployments and maintain momentum for further reductions. It would match U.S. and Russian forces, take advantage of Russian unilateral needs to restrict its force size, maintain stability and serve as a further reinforcement of the process of mutual reductions. There is no reason why the present verification systems could not be used or adapted for use for these kinds of steps. In short, there is some scope for parallel reciprocal steps to advance the cause of bilateral arms cuts, but we would certainly pursue the cuts through direct negotiations with the Russians, and then would seek to add the other nuclear weapons countries to this formal process.

We envision each side enjoying substantial latitude to choose the composition of their own forces according to their perceived security needs as long as they do not exceed the 900-warhead ceiling. This potential variation in the composition of forces is another reason why we characterize our proposed U.S. force structure as "illustrative." Our commission strongly supports an open debate on the appropriate make-up of U.S. nuclear forces, and acknowledges that honest differences of opinion exist. Experts differ on the relative merits of bombers, submarines and land-based missiles, for instance, and also debate whether it is necessary to maintain three different types of delivery vehicles in the U.S. arsenal.

From TRIAD to DYAD: Eliminating the Land-Based Missile Component

After evaluating the vulnerability, flexibility and other key characteristics of the different delivery systems, our commission concluded that a dyad of sea- and air-based strategic weapons would meet the post-Cold War requirements of deterring a WMD attack on the United States. The Minuteman land-based intercontinental ballistic missile (ICBM) would be eliminated in this scheme.

The elimination of Minuteman and consequently of the TRIAD of delivery vehicles in favor of a dyad stemmed from the fact that Minuteman is vulnerable and inflexible from a targeting standpoint.

Minuteman is vulnerable to sudden decimation unless it is launched promptly on tactical warning of an incoming Russian missile strike. The ability to launch promptly the Minuteman force (within a few minutes) is often touted as a virtue, but in reality it is a liability. In the (admittedly extremely improbable) event of a large-scale Russian nuclear missile strike against the three U.S. Minuteman fields, enormous pressure would be exerted upon the National Command Authority rapidly to authorize the immediate firing of the force en masse – the deadline for a presidential (or successor) execution decision would be 12 minutes at most. Moreover, the unleashing of Minuteman forces would necessitate unleashing other strategic missiles – notably Trident submarine missiles, because of the integrated operational nature of major attack options to assure full coverage of all intended targets.

The second severe deficiency of Minuteman is its targeting inflexibility. It is suitable for the most unlikely scenario – large-scale nuclear war with Russia – but is unsuitable for nuclear conflict with North Korea or Iran because it would have to fly over both Russia and China to reach either of them. In the very unlikely event of a U.S.-China nuclear conflict, Minuteman missiles would have to fly over Russia to reach China.

Put differently, the Minuteman force is suitable only for Russia contingencies, our least likely adversary in nuclear conflict. The other legs of the commission's proposed dyad offer means of dealing with almost any scenario involving a WMD threat to America from a nation-state adversary. Neither U.S. strategic submarine missiles nor strategic bombers are constrained by rigid flight trajectories. These are

versatile platforms that offer highly flexible angles of attack against practically any target on the globe. Although a prompt global strike by Minuteman could be carried out with a single warhead, a Trident missile could perform the same mission (if a small number would be downloaded to carry a single warhead instead of the multiple warheads now carried) without risk of causing Russia to think it is under nuclear missile attack and ordering a nuclear "counter-strike" in retaliation. Moreover, ballistic missile submarines on alert patrol can be fired almost as quickly as Minuteman missiles if so desired (15 minutes versus 2 minutes), although the commission did not identify scenarios in which the prompt launch of seabased ballistic missiles armed with nuclear warheads fulfilled any evident national security requirement.

One critic of the proposal to eliminate Minuteman (and cancel any follow-on nuclear ICBM program), the Chief of Staff of the Air Force, recently asserted that a critical virtue of this force is that it forces an enemy bent on attacking the United States to strike the American homeland. Gen. Norton Schwartz said, "Why do we have a land-based deterrent force? It's so that an adversary has to strike the homeland." In the commission's view, the optimal U.S. nuclear deterrent would ensure that the U.S. homeland is never struck with nuclear weapons in the event of war while preserving the full elements of deterrence currently available to the President.

De-Alerting Strategic Forces

The commission viewed unfavorably the continuing practice of keeping Minuteman and strategic submarines on launch-ready alert, and especially of gearing the nuclear command-control-communications and warning system from the President on down to the individual launch commanders for rapidly executing the forces in the opening phase of a nuclear conflict. (The Russia system is similarly organized.) The short-fused Minuteman and strategic submarine alert forces, together with the supporting rapid reaction command system, impose a severe constraint on presidential deliberation and choice during a crisis or conflict. Public reports of past experience with short time lines for decision making have shown that the process is flawed and that near cataclysmic errors have been narrowly avoided but made more likely by the rushed nature of the process. The president and his top advisors should have many more tools at their disposal, including non-nuclear options, and be afforded the time to deliberate and exercise these tools, which include diplomacy.

The day-to-day high alert posture of the United States today also represents a threat to Russia that has untoward unanticipated consequences for the United States. By dint of possessing the ability to fire U.S. strategic missiles promptly on warning ("launch-under-attack" in the operating vernacular), the United States concurrently possesses the ability to initiate a sudden massive strike against Russia (or any other country). This surprise attack option technically threatens the survival of almost all Russian nuclear forces in their day-to-day configuration unless, like the United States, Russia launches these forces out from under the attack, on warning. If coupled with U.S. missile defenses designed against Russia's strategic retaliatory forces – a current Russian fear despite American assurances that Russia is not a target of such defenses – the U.S. first-strike threat puts Russia on even greater vigilance and launch readiness.

The upshot is that both U.S. and Russian forces are kept on quick-launch alert because the other side does the same. This entwines the two countries in a proverbial "hair-trigger" dynamic that increases the risks of accidental, mistaken, inadvertent, misinformed or unauthorized launch with devastating consequences. Launch on false warning is doubly worrisome in light of the chronic deficiencies in Russian early warning that are not going away anytime soon. This is a serious risk not to be undertaken without the greatest care to avoid it and we believe that can be done with our proposals while still protecting the essential security interests of the nation.

These postures also set a terrible example for the other nuclear armed nations, who for various reasons have not yet adopted launch-ready postures for their own forces. As a rule, their warheads and bombs are kept separate from their means of delivery, a safe practice that greatly reduces the danger of an unintended nuclear exchange. We can imagine a multitude of grave dangers that would emerge if this practice is abandoned in favor of increasing the launch readiness of nuclear forces. Acute instability would arise if Pakistan, India, China and North Korea adopted a quick-launch posture requiring execution decisions to be made within minutes and seconds on the basis of attack early warning indications from satellite infrared or ground radar sensors. The risks of unauthorized launch, or the terrorist capture of dispersed assembled weapons, would also grow significantly.

In short, the current launch-ready postures of the United States and Russia are major sources of instability. They not only would generate pressure on leaders to make a premature decision on the use of nuclear weapons in a crisis, but they also run a risk of unintentional strikes. The postures pose an existential threat to the very survival of the United States, and Russia perceives no less cause for concern.

The commission therefore recommended the de-alerting of U.S. strategic forces in tandem with Russian de-alerting. A negotiated agreement that cuts the Gordian knot and allows both sides to stand down their forces would well serve their vital security and safety interests. In a similar vein, we also proposed that the United States deploy only 270 U.S. sea-based strategic warheads on day-to-day patrol, a number that is below the approximate threshold of 300 warheads that constitute a first-strike decapitation threat to Russia. This reduced deployment level would further allay Russian concern over its vulnerability and encourage it to get off of its dangerous "hair-trigger" launch posture.

If the U.S. strategic arsenal required 24 to 72 hours to generate the ability to fire and the Russians followed suit, the world would be far safer and a norm would be forged to encourage other countries to maintain their current practice of keeping weapons separated from their bombers, submarines and land-based rockets. Again, as we make clear, this is not a unilateral step but a reciprocal one with Russia to begin with and others to follow. It would be insured by the levels of reliability we have achieved and can achieve through further work on the verification systems and procedures that we have already engaged in our nuclear arrangements with Russia.

Prompt Launch Constrains Presidential Decision-Making

While some observers may view this 24-72 hour generation requirement as a constraint that would hobble a U.S. president in a crisis, our commission found that the current posture, which exerts pressure on the president to make a nuclear choice rapidly, is a far greater constraint. Launch-under-attack pressure severely hobbles presidential decision-making. It deprives our leaders of the time necessary for deliberation and of the tools needed to direct U.S. power to coherent national purpose.

New Strategy and Tools to Support Presidential Conflict Deliberation and Choice

This commission recommendation therefore undertakes the responsibility of suggesting a strategy that would relieve the pressure on our leaders and reduce our reliance on nuclear weapons as a primary or unique choice in the face of aggression. Our report lays out the elements of this strategy, which features a growing role for missile defenses and conventional forces including a new ICBM (HTV-2) with a

conventional warhead and sufficient range to reach practically any target in the world from home bases on U.S. soil without traversing Russian territory during flight. Its range and accuracy would provide an unprecedented tool for destroying critical targets globally within one hour. At present, the only tool available to the president for such a global quick strike is a nuclear warhead atop a land- or sea-based missile.

Missile defenses and conventional offensive forces as well as other kinetic and non-kinetic (cyber) tools of warfare, and various "soft power" tools would be designed to buy time for a day or two and exert non-nuclear leverage to resolve a dispute before it could escalate to nuclear dimensions. This strategy would empower a president, not hobble him. It would extend the deadline for a nuclear decision. It would help stabilize a crisis. Again, it is the paucity of non-nuclear options and the time pressure to resort to nuclear options that represents the fundamental problem for presidential choice.

Downsizing the Nuclear Complex; Risks and Cost Savings

Under the commission's plan, the number of different types of nuclear weapons in the U.S. active inventory would decrease from seven types today to four by 2022. The need to re-furbish weapons remaining in the stockpile would greatly diminish – almost all of weapons previously requiring it would be eliminated from the active inventory. This drastic curtailing of the life-extension program for thousands of weapons currently in the pipeline would save at least \$10 billion.

The existing plutonium pit facility at Los Alamos could readily service the regular pit manufacturing demands of a 900-warhead arsenal. Assuming a 50-year pit shelf life, only 2 percent of the active stockpile, or 18 warheads, would need to be remanufactured each year. The facility has a normal throughput capacity of about 20 per year with the option to add extra staff shifts in order to raise capacity to 40 pits per year. With the addition of extra equipment (5-6 years to install), the capacity could be increased to perhaps as high as 80 per year.

This number would grow higher still if old pits could be re-used and if pits with sensitive, conventional high explosives could be re-fitted with insensitive high explosives to improve safety. Current studies underway at the U.S. national laboratories to be completed within the next couple of years should determine the feasibility of these options. Preliminary analyses suggest that upwards of 50 percent of plutonium pits in the stockpile could be swapped out in these processes, allowing for a much faster rate of pit replacement.

In an emergency in which a systemic defect in one of the four warhead types warranted a crash effort to replace those warheads, it appears feasible that upwards of 120 defective weapons per year could be remedied through a combination of pit manufacturing and pit re-use. Such a systemic defect is a low-probability event, but assuming 225 defective warheads (notionally one-fourth of the 900-warhead total) needed to be repaired, it would take approximately two years of full-capacity work to finish the job.

In short, the current plutonium facility with some new equipment working overtime with other partners such as the Pantex facility could probably handle an unusual emergency to replace a big chunk of the arsenal. Our commission viewed this capability of the existing facilities as obviating the need to build the multi-billion dollar new facility now in early construction stage at Los Alamos. However, some small additional risk of reduced stockpile reliability must be acknowledged if we shrink the variety of warhead types from seven to four, and the margin of comfort for replacing an entire category of weapons in the event of a systemic defect is not large. On balance, our commission deemed these risks to be quite low,

and acceptable, but we strongly recommend a full-scope survey by the pertinent agencies (National Nuclear Security Administration – NNSA, the national laboratories, and Strategic Command) to determine an optimal infrastructure in support of the 900-warhead arsenal outlined in the commission report.

Downsizing the Nuclear Force Structure; Risks and Cost Savings

Unforeseen Nuclear Challengers?

Some readers of our report have raised the question whether our illustrative force would be stretched thin and fall short if an unanticipated threat of major proportions emerged from an unexpected source – perhaps an unfriendly state that unexpectedly breaks out a substantial nuclear arsenal, or an existing state such as China that greatly expands its nuclear arsenal. (In China's case, its recent nuclear modernization created an infrastructure capable of substantially increasing its existing small arsenal if it chose to do so.)

The answer to this question has three parts. First, this is an intelligence challenge that warrants an intelligence estimate as to the likelihood of such break-out or rapid expansion scenarios over the next 10 years. Our commission found no grounds to believe that the intelligence community places any credence in them. A Chinese surge is unlikely to yield an arsenal much larger than 250-300 warheads. A Russian surge appears both financially and technically implausible. Although Russia has begun a strategic modernization program with upwards of \$70 billion earmarked for this purpose over the next ten years (an amount far less than the planned U.S. strategic modernization budget over the same period), the ability of its military-industrial infrastructure to deliver the goods has proven to be quite impaired. Pakistan, currently an unfriendly ally of the United States, is rapidly growing its arsenal but its focus is India. Other candidates for such a surge are unclear to us. In short, while we do not claim clairvoyance, the prospect that any aspiring proliferator or existing nuclear-armed nation will undertake a crash build-up on a large scale is remote.

Second, it is highly doubtful that any of the hypothetical possibilities could unfold without being detected. Since the beginning of the nuclear age, no nation has ever produced enough nuclear weapons material to build a bomb without first being detected by foreign intelligence. (This applies even to the super-secret U.S. Manhattan project in the mid-1940s, before the advent of satellite surveillance or on-site inspections.) It strains credulity to project a breakout of such a magnitude over the next ten years that the United States would wake up one morning and find itself "out-gunned."

Third, in any case the proposed U.S. arsenal is sufficient to project a draconian threat of retaliation against any and all possible nuclear newcomers or late-bloomers over the next decade and beyond. It is sufficient to deter reliably any conceivable threat on the horizon.

Cost Savings

A significant cost savings would accrue if our illustrative force structure is implemented. An 80 percent force reduction that includes the elimination of all Minuteman missiles (and cancellation of its replacement), all B-52 bombers and all tactical nuclear forces in the U.S. inventory, combined with a scaling back of future strategic submarine construction from 12 to 10 boats and of the strategic bomber replacement aircraft to a minimum number of nuclear-capable aircraft (e.g., 30), would save an estimated

\$100 billion over the next 15 years. As noted earlier, the illustrative force would also impose lighter demands on the nuclear complex, saving an additional (est.) \$20 billion during this period. The total savings for our proposed nuclear architecture is roughly estimated to be \$120 billion over the next 15 years.

Conclusion

The nuclear strategy, force structure and posture proposed by our diverse commission of generals, diplomats, strategic arms negotiators and policymakers are not necessarily the Holy Grail for the next phase of our nation's pursuit of security in the 21st century. We believe, however, that our recommendations promise to more squarely and effectively address the real threats that our nation will be facing over the next decade than current U.S. nuclear policy promises. A fundamental transformation of our nuclear architecture and policy is needed to maintain a credible U.S. deterrent against classical risks of nuclear aggression by other nations while preserving strategic stability and protecting the nation against nuclear proliferation, terrorism, cyber warfare, failed states, organized crime, regional conflict and other threats the 21st century has wrought. We appreciate the opportunity to present our findings and join the debate.